

REMARKS

Prior to this response, claims 1-20 were pending in the present application, of which claims 1, 12, and 20 were independent claims. Upon entry of the amendments in this response, claims 2-11 and 13-22 will be pending, with claims 3, 4, 14, 15, and 20-22 being independent.

New independent claims 21-22 have been added, to replace prior independent claims 1 and 12. For reasons discussed below, claims 1 and 12 have been cancelled without prejudice. Claims 2-8, 11, 13-18 and 20 have been amended herein. No new matter is added by these amendments.

The total number of independent claims is now 7, and the total number of claims remains 20.

Allowable Subject Matter

Claims 4, 14 and 15 are objected to, but would be allowable if rewritten in independent form. Each of these claims has been rewritten in independent form to include their respective base claim and any intervening claim. Allowance of claims 4, 14, and 15 is requested.

112 Rejections

Claim 3 was rejected under 35 U.S.C. 112, second paragraph, because the phrase "conduct said search" was viewed as being indefinite. This was the only rejection to claim 3, which is similar to objected to claim 14.

Applicant has amended claim 3 for clarification. Reconsideration and withdrawal of the rejection are requested. Applicant has rewritten claim 3 in independent form to include its base claim 1 and intervening claim 2. Allowance of claim 3 is requested.

102 Rejections

Claims 1, 2, 8, 11-13 and 20 were rejected under 35 U.S.C. 102(e) as being anticipated by Tsourikov, *et al.* (U.S. Patent Number 6,167,370).

Claim 1 has been cancelled and claims 2, 8, and 11 depend from new claim 21. And claim 12 has been cancelled and claims 13 now depends from claim 22. Therefore, the rejections to claim 1 and 12 are not moot. Amended independent claim 20 has been amended in a manner similar to new claims 21 and 22.

With regard to new independent claim 21, Applicant has cast the problem statement generator differently from prior claim 1, but still in a manner consistent with the present application. In particular, Applicant describes a problem statement as a partially complete S-A-O, where an “X” indicates the semantic elements missing. For Tsourikov to anticipate the claimed problem statement generator it would have to provide an enabling disclosure of determining a problem statement in the S-A-O format – where at least one of the S, A, or O is missing. Tsourikov does not provide an enabling disclosure of the foregoing. In fact, Tsourikov does not teach a problem statement of any kind.

In claim 21, it is explicitly indicated that the knowledge base search is not a keyword search (as in Tsourikov). In the Background section of the present application, the Applicant discussed the drawbacks of prior art keyword searching and matching approaches. (Application, p. 2 para. 1 to p. 3 para. 2) Applicant then discussed the “need for a system that does not rely on pre-stored key wor[d] matching...” (Application, p. 3 para. 2 to p. 3 para. 1) The Applicant then went on throughout the application to describe an approach that relied on semantic analysis instead of keywords.

In contrast, Tsourikov explicitly does use a keyword approach. Tsourikov uses some semantic analysis to determine the keywords. But Tsourikov uses those keywords as the basis of its document retrieval search. Since claim 21 explicitly requires a non-keyword query and Tsourikov explicitly teaches a keyword search approach, Tsourikov does not provide an enabling disclosure of this aspect of claim 21.

Beyond claim 21 requiring a non-keyword search, it specifically requires that the semantic server performs the non-keyword query of the knowledge base “using the semantic elements and semantic relationships from the problem statement to find at least

one answer S-A-O.” Again, Tsourikov uses the keywords for searching, where semantic relationships between the keywords is not apparently used in the searching process.

Claim 21 also requires that the semantic server find one or more S-A-O answers “wherein the at least one answer S-A-O includes the A and O, S and A, S and O, or S from the problem statement and an S, A, or O to replace each X in the problem statement, thereby completing the S-A-O format.” This concept of finding an answer S-A-O that is the problem statement with the “X” from the problem statement replaced by an S, A, or O, to complete the S-A-O format, is not taught by Tsourikov.

For various reasons, Applicant believes that new claim 21 would not be anticipated by Tsourikov, since Tsourikov does not provide an enabling disclosure of each and every element of claim 21 – and, for example, only teaches keyword searching.

New independent claim 22 is a method claim that corresponds to new independent claim 21. Thus, claim 22 would also not be anticipated by Tsourikov for at least the same reasons as those discussed above.

Amended independent claim 20 has been amended in a manner similar to new claims 21 and 22. Thus, claim 22 is also not anticipated by Tsourikov for at least the same reasons as those discussed above.

Claims 2, 8, and 11 depend from new claim 21 and claim 13 depends from claim 22, therefore, these dependent claims are not anticipated by Tsourikov for at least the same reasons as discussed above.

103 Rejections

Claims 1, 11, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz 1 (“Annotating the World Wide Web using Natural Language”), in view of Katz 2, *et al.* (“Integrating Web Resources and Lexicons into a Natural Language Query System”).

Claims 1 and 12 have been cancelled, so those rejections are not moot.

New claim 21 would not be made obvious by Katz 1 and 2. Here is a list of substantial differences between Katz and the claimed approach:

a. In the claimed case, the linguistic analysis of both natural language question and textual knowledge base results in building of semantic index as Subject-Action-Object. This differs from Katz's approach, who builds Subject-Verb (Relation)-Object index (see Katz page 1: "kernel sentences usually containing one verb"). In the present application, the 'Action' means a semantic component, which is significantly broader than grammatical component 'Verb'.

b. In addition, Katz builds his index only for user questions (of particular types). But in contrast to our approach, he does not build this index for a textual knowledge base. He assumes that the full-text fragments are manually annotated (see Katz page 5, see footer reference) in the form of short sentence.

c. The result of the claimed approach is an exact answer to a user's question, but Katz brings a whole textual fragment, which at some level is relevant to a user's question.

d. In the present invention, there is apparent deep linguistic analysis of free text. In contrast, Katz admits that "it is becoming increasingly clear that a robust full-text natural language question-answering system cannot be realistically expected any time soon." (see Katz, pages 4-5).

With particular regard to the problem statement generator of claim 21, for example, Katz does not teach the S-A-O format, or problem statements as incomplete S-A-Os. As noted above, to the extent Katz discusses using the Subject-Verb (or Relation)-Object approach, a Verb and Action are different things. A Verb has a much smaller set of words and relationships than an Action. Use of the S-A-O format in the present invention is more than an obvious difference from Katz because they are quite different semantic entities, and the design, programming, and implementation differences are certainly not trivial.

The T-expression derived from natural language inputs in Katz are used for matching with T expressions in the knowledge base. Katz himself discusses the extreme limitations that result from such rigid matching of syntactical structures. (see Katz, page 2, col. 2) Katz then describes having to create and use special rules to improve the otherwise significantly limited T-expression matching approach. In Katz, for example, an S-rule is used to solve the problem caused by the verb *surprise*. (see Katz, page 3, 1st para.) Many verbs would require such a rule. Each S-rule is made up of 2 parts: an If part and a Then part. Each S-rule operates in two modes: Forward and Backward. (see Katz, page 3) However, the present invention does not use T expression matching and so does not suffer the same shortcomings as Katz 1 – and does not rely on specialized S-rules to try to overcome such limitations with respect to specific verbs in the English language. And Katz 1 does not make obvious problem statement generation, where the problem statement is in an incomplete S-A-O.

The Office Action acknowledged that Katz 1 does not teach answers that have links to documents, but says Katz 2 teaches such document links. As noted above, stored T expressions are not answer S-A-Os, having the S-A-O format. Thus Katz 1 and Katz 2 do not teach this claim element.

Claim 21 also requires that a semantic server provide a search as a “non-keyword query of the knowledge base using the semantic elements and semantic relationships from the problem statement to find at least one answer S-A-O, wherein the at least one answer S-A-O includes the A and O, S and A, S and O, or S from the problem statement and an S, A, or O to replace each X in the problem statement, thereby completing the S-A-O format.” START relies on *syntactic* analysis and does not use semantic elements and relationships from the problem statement to search an answer database to find at least one answer S-A-O, which provides an S, A, or O for each “X” in the problem statement – thereby completing the S-A-O format.

For several reasons, therefore, Katz 1 and Katz 2, whether alone or in combination, do not make obvious each and every element of claim 21.

New independent claim 22 is a method claim that corresponds to new independent claim 21. Therefore, Katz 1 and Katz 2, whether alone or in combination, do not make obvious each and every element of claim 22 for at least the same reasons as those discussed above.

Amended independent claim 20 has been amended in a manner similar to new claims 21 and 22. Thus, Katz 1 and Katz 2, whether alone or in combination, do not make obvious each and every element of claim 20 for at least the same reasons as those discussed above.

Claim 11 depends from new claim 21. Therefore, Katz 1 and Katz 2, whether alone or in combination, do not make obvious each and every element of claim 11 for at least the same reasons as those discussed above.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katz, in view of Katz, *et al.*, and further in view of Paik, *et al.* (United States Patent Number 6,263,335) and further in view of Brown, *et al.* (United States Patent Number 6,665,666). Claims 6, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz, in view of Katz, *et al.*, and further in view of Paik, *et al.* Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katz, in view of Katz, *et al.*, and further in view of Mueller, *et al.* (United States Patent Number 6,009,398), and further in view of Brown, *et al.* Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katz, in view of Katz, *et al.*, and further in view of Mueller, *et al.* Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katz, in view of Katz, *et al.*, and further in view of Paik, *et al.*, and further in view of Mueller, *et al.* Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katz, in view of Katz, *et al.*, and further in view of Brown, *et al.*

Claims 5-10 depend from new claim 21 and claims 16-19 depend from new claim 22. Therefore, Katz 1 and Katz 2, whether alone or in combination, do not make obvious

each and every element of these claims for at least the same reasons as those discussed above.


Closing Remarks

It is submitted that all claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

In connection with this matter, please charge any otherwise unpaid fees which may be due, or credit any overpayment, to Deposit Account No. 501798.

Respectfully submitted,

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